Archives of Biochemistry and Biophysics

VOLUME 158

1973

UNIVERSITY OF HAWAII LIBRARY

LIBRARY USE ONLY

Academic Press New York and London

A Subsidiary of Harcourt Brace Jovanovich, Publishers

Copyright © 1973 by Academic Press, Inc.

All Rights Reserved

No part of this publication may be reproduced or transmitted in any form, or by any means, electronic or mechanical, including photocopy, recording, or any information storage and retrieval system, without permission in writing from the copyright owner.

Made in the United States of America

ARCHIVES OF BIOCHEMISTRY AND BIOPHYSICS 158, iii–ix (1973)

CONTENTS OF VOLUME 158

NUMBER 1, SEPTEMBER 1973

OBITUARY FOR F. F. NORD iii

BIOLOGICAL OXIDATION AND BIOENERGETICS

Respiratory Activation of 2,4-Dinitrophenol-Stimulated ATPase Activity in Plant Mitochondria ..... D. W. JUNG AND J. B. HANSON 139

Energy Dependent Changes in the Cytochromes of the Mitochondrial Respiratory Chain ..... DAVID F. WILSON AND ELIZABETH S. BROCKLEHURST 200

The Dependence on Energy and K^+ Ions of the Accumulation of Glutamate by Rat Liver Mitochondria ..... E. J. HARRIS, J. A. BANGHAM, AND J. M. WIMHURST 236

The Effect of *o*-Diphenols upon the Microsomal NADPH and NADH Oxidase Activities.
OHÁRA AUGUSTO, ETELVINO J. H. BECHARA, DIVO L. SANIOTO, AND GUISEPPE CILENTO 359

Superoxide Dismutase: A Comparison of Rate Constants.
HENRY J. FORMAN AND IRWIN FRIDOVICH 396

CELLULAR DIFFERENTIATION AND DEVELOPMENT

Alkaline Phosphatase in KB Cells: Influence of Hyperosmolality and Prednisolone on Enzyme Activity and Thermostability ..... FRITZ HERZ 225

Nucleoside Diphosphatase from Pig Liver: Purification and Some Properties.
CAROL L. PINSLEY AND MICHAEL C. SCRUTTON 331

ENZYME MECHANISMS AND METABOLISM

Purification and Properties of Human Liver Monoamine Oxidase.
IRIS F. NORSTRAND AND MORTON D. GLANTZ 1

δ-Aminolevulinic Acid Dehydratase of *Rhodopseudomonas capsulata*.
D. L. NANDI AND DAVID SHEMIN 305

Gadolinium as a Probe of the Alkaline Earth and ATP-Metal Binding Sites in Pyruvate Kinase ..... K. M. VALENTINE AND G. L. COTTAM 346

IMMUNOCHEMISTRY

The Immunological Properties of the *Clostridium pasteurianum* Rubredoxin.
KERRY T. YASUNOBU AND WALTER LOVENBERG 84

LIPIDS

Subunit Structure of α-Acetohydroxy Acid Isomeroreductase from *Salmonella typhimurium*.
ELEANOR D. SHEMATEK, WARREN F. DIVEN, AND STUART M. ARFIN 126

A Kinetic Study of α-Acetohydroxy Acid Isomeroreductase from *Salmonella typhimurium*.
ELEANOR M. SHEMATEK, STUART M. ARFIN, AND WARREN F. DIVEN 132

Copyright © 1973 by Academic Press, Inc.
All rights of reproduction in any form reserved.

The Synthesis of 3-Nonaprenyl-4-hydroxybenzoate in Rat Liver Mitochondria: The Effect of Ca^{2+}, Mg^{2+}, Chelators, and Bacitracin on the Activity of *p*-Hydroxybenzoate-Polyprenyl Transferase.
Nisson Schechter, Tokuzo Nishino, and Harry Rudney 282
Structures of Ascaroside Aglycones. George E. Tarr and H. K. Schnoes 288
The Exchange of Phospholipids Between Subcellular Organelles of the Liver.
S. A. Kamath and Emanuel Rubin 312
Differential Regulation of the *N*-Methyl Transferases Responsible for Phosphatidylcholine Synthesis in *Saccharomyces cerevisiae*.
Charles J. Waechter and Robert L. Lester 401
A Microsomal Fatty Acid Synthetase Coupled to Acyl-CoA Reductase in *Euglena gracilis*. Abdul A. Khan and P. E. Kolattukudy 411

MEMBRANE STRUCTURE AND FUNCTION

Differential Effects of Metal Chelators on Na^+, K^+-ATPase Activity.
E. T. Wallick, J. C. Allen, and A. Schwartz 149
Some *In Vivo* and *In Vitro* Effects of Ethacrynic Acid on Renal Na^+, K^+-ATPase.
C. Inagaki, M. Martinez-Maldonado, and A. Schwartz 421
The Pancreatic β-Cell Recognition of Insulin Secretagogues. VII. Binding and Permeation of Chloromercuribenzene-*p*-Sulphonic Acid in the Plasma Membrane of Pancreatic β-Cells.
Bo Hellman, Åke Lernmark, Janove Sehlin, Monica Söderberg, and Inge-Bert Täljedal 435

NUCLEIC ACIDS

Preparation and Partial Fractionation of Nonhistone Chromosomal Proteins from Human Diploid Fibroblasts. Leonard H. Augenlicht and Renato Baserga 89
Purification and Characterization of Alkaline Ribonuclease Inhibitor from Normal and Nephrotic Rat Kidney Compared to Inhibitor from Rat Liver.
Edward S. Bishay and Doris M. Nicholls 185
The Nonhistone Nuclear Proteins of Some Rat Tissues.
M. Gronow and T. Thackrah 377

PHOTOSYNTHESIS AND PLANT BIOCHEMISTRY

Purification and Crystallization of Three Isoenzymes of Malate Dehydrogenase from *Zea mays* Seed. Russell A. Curry and Irwin P. Ting 213

PHYSICAL BIOCHEMISTRY AND PHYSICAL CHEMISTRY OF MACROMOLECULES

Polymerization Studies on Protein from the Dahlemense Strain of Tobacco Mosaic Virus: Light Scattering and Related Studies.
S. Srinivasan and Max A. Lauffer 53
Polymerization Studies on Protein from the PM2 Strain of Tobacco Mosaic Virus: Light Scattering and Related Studies. S. Srinivasan and Max A. Lauffer 67
The Donnan Effect in Tobacco Mosaic Virus and its Components.
Arthur L. Adiarte and Max A. Lauffer 75
Carbon-13 Nuclear Magnetic Resonance Studies of Polyamino Acids: The Helix-Coil Transition of Poly-L-Lysine. Hazime Saitô and Ian C. P. Smith 154

Small Angle Light Scattering of Bioparticles. IV. Spleen Cells and Liver Nuclei.
R. J. Fiel and H. M. Scheintaub 164
Polyanion Induced Physical Changes in Isolated Nuclei.
H. M. Scheintaub and R. J. Fiel 171

POLYSACCHARIDES AND COMPLEX CARBOHYDRATES

Incorporation of Glucosamine into Rhodopsin in Isolated Bovine Retina.
Paul J. O'Brien and Consuelo G. Muellenberg 36
Interconversion of the A and B Forms of Ceramide Trihexosidase from Human Plasma.....Carol A. Mapes and Charles C. Sweeley 297

PROTEIN CHEMISTRY

Photosensitized Oxidation of Elastase. Selective Modification of the Tryptophyl Residues.....Guilio Jori, Guido Galiazzo, and Orfeo Buso 116
The Distribution of Iron in Ferritin.....Yoshiro Niitsu and Irving Listowsky 276
The Disulfide Bridges of Duck Egg-White Lysozyme II.
Jacques Hermann, Jacqueline Jollès, and Pierre Jollès 355
Mechanism of Action of Thrombin on Fibrinogen. III. Partial Mapping of the Active Sites of Thrombin and Trypsin.
Ronald K. H. Liem, and Harold A. Scheraga 387

PROTEIN SYNTHESIS

Ribonucleotide Reductase Activity During the Cell Cycle of *Saccharomyces cerevisiae*.
Margaret Lowdon and Eberhards Vitols 177
Selective Inhibition of f2 RNA Translation by Sulfhydryl Reagents.
Robert E. Singer and Thomas W. Conway 257
Translation of Reovirus Messenger Ribonucleic Acids Synthesized *in Vitro* into Reovirus Proteins in a Mouse L Cell Extract.
W. D. Graziadei III, D. Roy, W. Konigsberg, and P. Lengyel 266
Genetic Variation in the Carbonic Anhydrase Isozymes of Macaque Monkeys. III. Biosynthesis of Carbonic Anhydrases in Bone Marrow Erythroid Cells and Peripheral Blood Reticulocytes of *Macaca nemestrina*.
Joseph Desimone, Erik Magid, Margareta Linde, and Richard E. Tashian 365

REGULATION OF METABOLISM AND OF ENZYME ACTION

Influence of Different Types of Narcosis and of Neck Fracture on the Concentration of Glycolytic Intermediates and Related Compounds in Rat Liver.
H. J. Sietz, R. P. Faupel, S. C. Kampf; and W. Tarnowski 12
Comparative Studies on Glycerol 3-Phosphate Dehydrogenase in Bees and Wasps
Steven C. Fink and Ronald W. Brosemer 19
Immunochemical Studies with Glycerol 3-Phosphate Dehydrogenase in Bees and Wasps
Steven C. Fink and Ronald W. Brosemer 30
Immunological Studies on Glucose 6-Phosphate Dehydrogenase of Rat Liver
Akiharu Watanabe and Kazuhisa Taketa 43
Turnover of Chromosomal Proteins from Rat Liver
J. Fred Dice and Robert T. Schimke 97
Regulation of Glycolysis in Muscle. The Role of Ammonium and Synergism Among the Positive Effectors of Phosphofructokinase
Gopi A. Tejwani, Abburi Ramaiah, and M. Ananthanarayanan 195

Purification and Properties of Thiaminephosphate Pyrophosphorylase of *Escherichia coli* Yoshie Kayama and Takashi Kawasaki 242

Effects of Methionine and Vitamin B_{12} on the Activities of Methionine Biosynthetic Enzymes in *met*J Mutants of *Escherichia coli* K12 Ronald C. Greene, Robert D. Williams, Hsiang-Fu Kung, Carlos Spears, and Herbert Weissbach 249

Differential Characteristics of the Cytosol and Mitochondrial Isozymes of Malic Enzyme from Bovine Brain. Effects of Dicarboxylic Acids and Sulfhydryl Reagents Rene Frenkel and Adriana Cobo-Frenkel 323

STRUCTURAL PROTEINS

Isolation of Polypeptides Containing the Intermolecular Cross-Link δ,δ'-Dihydroxylsinonorleucine from Dentin Collagen Yoshinori Kuboki, Marvin L. Tanzer, and Gerald L. Mechanic 106

COMMUNICATIONS

The *N*-Oxidation of Alkylhydrazines Catalyzed by the Microsomal Mixed-Function Amine Oxidase Russell A. Prough 442

Lipid Dependence of Plant Microsomal Cinnamic Acid 4-Hydroxylase Theresia Büche and Heinrich Sandermann, Jr. 445

ERRATA

Purification and Properties of D(—)-Lactate Dehydrogenase from *Leuconostoc mesenteroides* Rebecca C. Garland 448

The Pyridoxal Phosphate-Binding Site of Rabbit Muscle Aldolase M. Anai, C. Y. Lai, and B. L. Horecker 449

Author Index 450

Number 2, October 1973

BIOLOGICAL OXIDATION AND BIOENERGETICS

Induction of Microsomal Aryl Hydrocarbon (3,4-Benzo(α)pyrene) Hydroxylase and Cytochrome P-450$_K$ in Rat Kidney Cortex. I. Characteristics of the Hydroxylase System Robert Grundin, Sten Jakobsson, and Dominick L. Cinti 544

Induction of Microsomal Aryl Hydrocarbon (3,4-Benzo(α)pyrene) Hydroxylase and Cytochrome P-450$_K$ in Rat Kidney Cortex. II. Interactions with the Induced Hemoprotein Sten Jakobsson, Robert Grundin, and Hjördis Thor 556

Cytochrome P-450$_K$ of Rat Kidney Cortex Microsomes: Further Studies on its Interaction with Fatty Acids. Åke Ellin, Sten Orrenius, Åke Pilotti, and Carl-Gunnar Swahn 597

Purification and Properties of Two Ferredoxins from the Nitrogen-Fixing Bacterium *Bacillus polymyxa* Duane C. Yoch 633

Expression of Aryl Hydrocarbon Hydroxylase Induction in Mouse Tissues *in Vivo* and in Organ Culture Kurt Bürki, A. G. Liebelt, and Edward Bresnick 641

Mammalian Melanogenesis: Tyrosinase Versus Peroxidase Involvement, and Activation Mechanisms Vincent J. Hearing 720

Relation of Phospholipase D Activity to the Decay of Succinate Dehydrogenase and of Covalently Bound Flavin in Yeast Cells Undergoing Glucose Repression. Shlomo Grossman, John Cobley, P. K. Hogue, Edna B. Kearney, and Thomas P. Singer 744

Characterization of Shuttle Mechanisms for the Transport of Reducing Equivalents into Mitochondria.
ARTHUR I. CEDERBAUM, CHARLES S. LIEBER, DIANA S. BEATTIE, AND EMANUEL RUBIN 763

H_2O_2 Production and Cytochrome *c* Peroxidase Activity in Mitochondria Isolated from the Trypanosomatid Hemoflagellate *Crithidia fasciculata*.
J. PETER KUSEL, ALBERTO BOVERIS, AND BAYARD T. STOREY 799

Lipid Peroxidation and the Degradation of Cytochrome P-450 Heme.
WAYNE LEVIN, ANTHONY Y. H. LU, MARTIN JACOBSON, RONALD KUNTZMAN, J. LEE POYER, AND PAUL B. MCCAY 842

CELLULAR DIFFERENTIATION AND DEVELOPMENT

Properties of Mitochondrial Thymidine Kinases of Parental and Enzyme-Deficient Hela Cells. . . . . SAUL KIT, WAI-CHOI LEUNG, AND DAVID TRKULA 503

Studies of Mitochondrial Energy Systems during Embryogenesis in the Rat.
BRUCE MACKLER, RICHARD GRACE, BYRON HAYNES, GERALD J. BARGMAN, AND THOMAS H. SHEPARD 662

Coordinate Regulation of Purine Nucleoside Phosphorylase and Xanthine Dehydrogenase Levels in Chick Liver.
P. C. LEE, J. S. NICKELS, AND J. R. FISHER 677

Adaptive Enzyme Responses in Adipose Tissue of Obese Hyperglycemic Mice.
MURRAY L. KAPLAN AND GEORGE H. FRIED 711

ENZYME MECHANISMS AND METABOLISM

Phospholipase A_2 Activity Towards Phosphatidylcholine in Mixed Micelles: Surface Dilution Kinetics and the Effect of Thermotropic Phase Transitions.
EDWARD A. DENNIS 485

Bacillus megaterium, KM β-Galactosidase: Purification by Affinity Chromatography and Characterization of the Active Species.
HARVEY B. POLLARD AND EDWARD STEERS, JR. 650

Kinetic Studies of a $NADP^+$-Specific Isocitrate Dehydrogenase from *Salmonella typhimurium*. Purification and Reaction Mechanism.
J. JOSEPH MARR AND MORTON M. WEBER 782

Kinetic Studies of a Hepatoma Alkaline Phosphatase.
KAZUYA HIGASHINO, MAMORU HASHINOTSUME, YUICHI YAMAMURA, AND MOTOJI FUJIOKA 792

Studies with a Mathematical Model of Folate Metabolism.
R. C. JACKSON AND K. R. HARRAP 827

LIPIDS

Palmitate Incorporation into Lipids by Lung Subcellular Fractions.
E. G. TOMBROPOULOS 911

MEMBRANE STRUCTURE AND FUNCTION

New Electrophoretic Information on the Surface Composition of the Rat Erythrocyte.
HOWARD C. MEL, TOM TENFORDE, AND ROBERT M. GLAESER 533

Specificity of Sugar-Phospholipid Interactions. . . . . J. MARTYN BAILEY 586

Synthesis of Cyclopropane Fatty Acids in Isolated Bacterial Membranes.
G. STANLEY COX, EDWIN THOMAS, H. R. KABACK, AND HERBERT WEISSBACH 667

Studies on the Characterization of the Sodium–Potassium Transport Adenosinetriphosphatase. XII. Evidence for Interaction of the Acyl Phosphate at the Active Site with Neighboring Groups.
KAVI RATANABANANGKOON AND LOWELL E. HOKIN 695

NUCLEIC ACIDS

Characterization of Synthetic Rabbit Globin DNA.
JEFFREY ROSS, HAIM AVIV, AND PHILIP LEDER 494
Bacteriophage-Coded Thymidylate Synthetase: Characteristics of the T4 and T5 Enzymes. . . . GLORIA R. CAPCO, JAN R. KRUPP, AND CHRISTOPHER K. MATTHEWS 726
Bacteriophage-Coded Thymidylate Synthetase. Evidence that the T4 Enzyme is a Capsid Protein. . . . . GLORIA R. CAPCO AND CHRISTOPHER K. MATTHEWS 736

PHOTOSYNTHESIS AND PLANT BIOCHEMISTRY

Studies on Photosystem I. I. Relationship of Plastocyanin, Cytochrome *f* and P700.
JAMES N. SIEDOW, VIRGINIA A. CURTIS, AND A. SAN PIETRO 889
Studies on Photosystem I. II. Involvement of Ferredoxin in Cyclic Electron Flow.
VIRGINIA A. CURTIS, JAMES N. SIEDOW, AND A. SAN PIETRO 898

PHYSICAL BIOCHEMISTRY AND PHYSICAL CHEMISTRY OF MACROMOLECULES

Escherichia coli B 5-Methyltetrahydrofolate-Homocysteine Cobalamin Methyltransferase: Circular Dichroism of the Methylated and Propylated Holoenzymes.
ROBERT T. TAYLOR AND M. LESLIE HANNA 526
Thermal Stability of Proteins. . . . . HENRY B. BULL AND KEITH BREESE 681
The Effect of Organic Compounds on the Crystal Habit and Crystallization of Normal and Sickle Cell Hemoglobin in Phosphate Buffer.
KATHERINE J. FARNELL AND THOMAS L. MCMEEKIN 702
Electron Spin Resonance of Myosin Spin Labeled at the S_1 Thiol Groups During Hydrolysis of Adenosine Triphosphate. . . . . J. C. SEIDEL AND J. GERGELY 853
Optical Multichannel Analyzer as a Scanner for the Ultracentrifuge. I. Single Beam Operation. . . . . E. G. RICHARDS AND D. ROCKHOLT 864

POLYSACCHARIDES AND COMPLEX CARBOHYDRATES

β-D-Galactosidase and β-D-Fucosidase of Pig Kidney.
G. YA. WIEDERSHAIN AND A. A. PROKOPENKOV 539
Crystallization and Partial Characterization of *Staphylococcus aureus* Hyaluronate Lyase. . . . . GOPAL S. RAUTELA AND CARL ABRAMSON 687
Inhibition and Activation of Chitin Synthesis by *Mucor rouxii* Cell Extracts.
I. MCMURROUGH AND S. BARTNICKI-GARCIA 812
α-L-Iduronidase Activity in Cultured Skin Fibroblasts and Amniotic Fluid Cells.
CLARA W. HALL AND ELIZABETH F. NEUFELD 817

PROTEIN CHEMISTRY

Purification and Serological Comparison of the Yeast Hexokinases P-I and P-II.
FRANCES C. WOMACK, M. KATE WELCH, JUDITH NIELSEN, AND SIDNEY P. COLOWICK 451
Chemistry and Subunit Structure of Yeast Hexokinase Isoenzymes.
JAMES J. SCHMIDT AND SIDNEY P. COLOWICK 458

Identification of a Peptide Sequence Involved in Association of Subunits of Yeast Hexokinases. . . . . James J. Schmidt and Sidney P. Colowick 471
Acid-Catalyzed Esterification of Lysozyme in Methanol. Reactivities of Individual Carboxyl Groups. . . . . Karl J. Kramer and J. A. Rupley 566
Quenching of the Fluorescence of Proteins by Silver Nitrate. . . . . Raymond F. Chen 605
Some Properties of a Ficin-Papain Inhibitor from Avian Egg White.
Lourminia Carino Sen and John R. Whitaker 623
Graphical Analyses on Binding of Ligands to a Two-Sited System. Theoretical Treatments Exemplified on Yeast Phosphoglycerate Kinase.
Märtha Larsson-Raźnikiewicz 754
A Simple Preparation of β-Trypsin Based on a Calorimetric Study of the Thermal Stabilities of α- and β-Trypsin.
Ronald A. Beardslee and James C. Zahnley 806
The pH Induced Modification of the Electrophoretic Mobilities of Horseradish Peroxidase Isozymes. . . . . Edwin H. Liu and D. T. A. Lamport 822

PROTEIN SYNTHESIS

Protein Synthesis in Cultured Muscle Cells: Methylation of Nascent Proteins.
Minocher Reporter 577

REGULATION OF METABOLISM AND OF ENZYME ACTION

Regulation of Glutamine Synthetase Adenylylation and Deadenylylation by the Enzymatic Uridylylation and Deuridylylation of the P_{II} Regulatory Protein.
John H. Mangum, Giulio Magni, and Earl R. Stadtman 514
Effects of Salts and pH on the Rate of Erythrocyte Diphosphoglycerate Mutase.
Zelda B. Rose 903

STRUCTURAL PROTEINS

Hydroxyproline Content Determines the Denaturation Temperature of Chick Tendon Collagen. . . . . Joel Rosenbloom, Margaret Harsch, and Sergio Jimenez 478

COMMUNICATIONS

Isolation of a Glucose-Binding Protein by Affinity Chromatography on Phloretin-Agarose. . . . . Franklin F. Fannin and Donald F. Diedrich 919
Hemoglobin Heterogeneity in the Rabbit: β-112 Isoleucine → Valine.
Mir Shamsuddin, R. George Mason, Carl Cohen, Robert G. Tissot, and George R. Honig 922
Author Index. 925
Subject Index for Volume 158 will appear in the December 1973 issue as part of a cumulative index for the year 1973.